GROUND WATER PROTECTION IN VIRGINIA

2004 ANNUAL REPORT OF THE GROUND WATER PROTECTION STEERING COMMITTEE

THE DIVISION OF

Consolidated Laboratory Services (DCLS)

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DCLS supports many local, state and federal agencies that serve to protect Virginia's ground and surface waters and 2003 was a busy year.

On June 11, 2003 we celebrated the grand opening of our new 195,000 square foot facility. This facility, located at 600 N. 5th Street in Richmond, houses over 200 laboratory scientist and support staff. It was designed and equipped to improve safety and efficiency for providing over 4 million analyses annually. In 2003, over 14% of the samples tested by DCLS were ground, surface and other environmental water samples.

DCLS also supported many agencies responding to natural and manmade disasters and other emergencies. DCLS tested nearly 3000 water samples in 2003 when water sources were threatened by drought, floods, chemical spills and security breaches. DCLS staff also worked with the EPA to develop emergency support methods to filter and test large volumes of water for biological agents and draft a protocol toolbox and analytical guide for detecting chemical agents in drinking water.

Nearly 40,000 environmental water samples were collected and submitted to DCLS for routine analysis in 2003. A chart illustrating the percentages of the

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The U.S. Geological Survey (USGS)

The U.S. Geological Survey (USGS) continues to carry out several cooperatively funded hydrologic investigations of Virginia's ground-water resources. These investigations are providing relevant and reliable hydrogeologic information that will contribute toward assessing, managing, and protecting the Commonwealth's ground-water resources. Among the current efforts, the USGS continued the cooperatively funded assessments on the availability of ground water in the northern Shenandoah Valley carbonate and siliciclastic aquifer systems with Frederick, Warren, and Clarke counties, and the North Fork Shenandoah River minimum instream flow investigation with the Northern Shenandoah Valley Regional Commission. These studies, as well as those in neighboring Berkeley and Jefferson counties and the Leetown Science Center in West Virginia, led to the formation of the Great Valley Water-Resources Science Forum in 2003 (http://va.water.usgs.gov/GreatValley/Index.htm), and the initiation of a USGS multidisciplinary regional assessment to characterize the aquifer systems in the Shenandoah Valley region of Virginia and West Virginia. The objective of this effort is to provide hydrogeologic information that can be used to guide the development and management of the region's water resources.

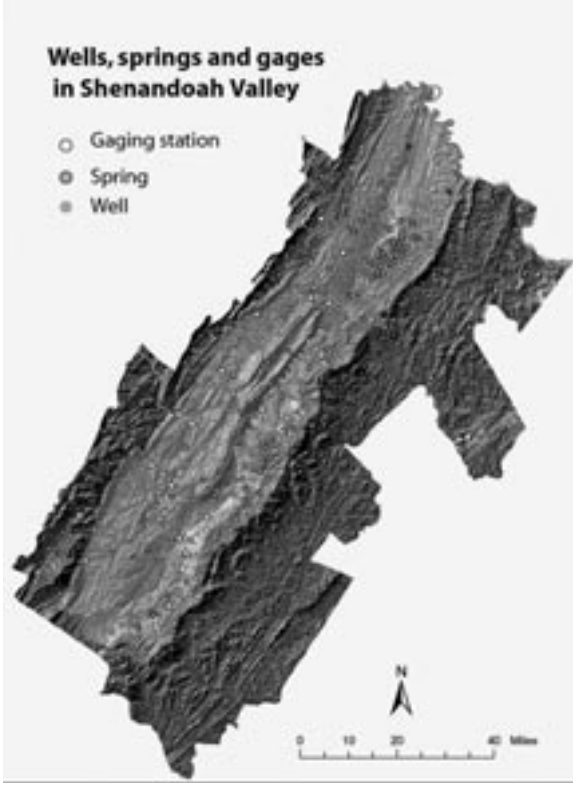

Figure 1. *Area included in the regional ground-water-flow model of the Shenandoah Valley.*

In 2004 development began of a regional ground-water-flow model of the Shenandoah Valley. The model boundaries will generally coincide with the drainage area of the Shenandoah River and will extend from the Potomac River to the watershed divide south of Staunton, and will be bounded to the east and west by the Blue Ridge and North Mountain fault zone, respectively (figure 1). The modeled area will include the Opequon Creek basin. The bottom boundary of the model will be about 1,000 feet below land surface on the valley floor, a depth that is near sea level and similar to the maximum reported depths of wells in the valley. The anticipated grid-cell size is about 500 meters, creating a model grid with 43,600 cells. There could be as many as 10 model layers, resulting in more than 400,000 active cells.

The effort pulls together the expertise of the hydrologic, geologic, geographic, and biologic disciplines in order to investigate the availability of water resources required to support an increasing population and sustain a healthy aquatic ecosystem within this region. Information collected during this study will be disseminated in an accessible format for Federal, State, and local policymakers, who need a comprehensive dataset for water-resources management, and to the general public.

The USGS also is continuing assessment of the Virginia Beach shallow aquifer system. On-going changes in ground-water levels are being measured from a network of eight continuously monitored wells. In addition, a ground-water model developed during 2003 is being refined across the central transition zone separating urban land use in the north from the rural area to the south. The refined model is being used to simulate hypothetical effects on the ground-water system from activities such as golf-course irrigation, open-pit mining, and residential development. More details are available from a project web site at http://va.water.usgs.gov/projects/va113.html

A three-year project to update and revise the Eastern Shore ground-water flow model also continues from its inception in 2003. This project is being conducted in cooperation with the Accomack-Northampton PDC, and the Virginia

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DCR Division of Natural Heritage

The Karst Program made significant steps in the protection of Virginia's karst resources during 2003 through a combination of data development, education, and technical assistance to agencies and localities. Program activities whenever possible were oriented toward the development and implementation of policies, best management practices, and data products designed to proactively prevent or mitigate the impact of existing or new land used practices on karst resources.

In the realm of data development, these efforts concentrated on two fronts. First, staff continues to work cooperatively with Heritage Program data management staff, the Virginia Cave Board, Virginia Tech contract staff, and the nonprofit Virginia Speleological Survey to develop conservation sites for Virginia's approximately 400 designated significant caves. A conservation site is the landscape area in which land use activities could reasonably be expected to have an impact on a specific natural heritage resource, in this case, significant caves or rare cave-dwelling fauna. The vast majority of conservation site development time is spent on the delineation through tracer dye studies of watersheds for hydrologically significant caves. This process led to the second data development initiative, the creation of a GIS-based *Karst Hydrology Atlas of Virginia*. Although Virginia's karst watersheds are poorly defined compared to the neighboring states of West Virginia and Kentucky, there still exists a significant body of work delineating karst watersheds. Unfortunately, no common repository exists for this data, and the published sources in many cases do not provide enough detail to be useful. Karst Program staff is working, with principle investigators wherever possible, to assemble a GIS coverage containing the highest level of detail available and to make this product available free of charge over the world-wide web.

Demand for karst education and outreach programs, in particular Project

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CBLAD to Merge With DCR

The final budget document adopted by the 2004 General Assembly included an amendment to merge the functions and budget resources of the Chesapeake Bay Local Assistance Department into the Department of Conservation and Recreation (DCR). The amendment further specified that the agencies, consolidated as DCR, shall continue to use these budget resources and staff to provide assistance to localities pursuant to the Chesapeake Bay Preservation Act, § 10.1-2100, et seq., Code of Virginia, and that the Chesapeake Bay Local Assistance Board shall be continued as a collegial body, with all of its authorities and responsibilities.

Effective July 1, 2004, the Chesapeake Bay Local Assistance Department will become the Division of Chesapeake Bay Local Assistance within DCR. For the immediate future, the address and telephone contact information will remain the same. The offices are located in the James Monroe Building, 101 North 14th Street, Richmond, Virginia, 23219, and the telephone numbers are: toll-free, 1-800-CHESBAY or (804) 225-3440. The FAX line is (804) 225-3447. The DCR website will now include the new Division of Chesapeake Bay Local Assistance, and related information. Visit www.dcr.state.va.us or www.cblad.virginia.gov

The Secretary of Natural Resources, in consultation with the Tidewater localities and Tidewater Soil and Water Conservation Districts, will prepare an agency reorganization plan for submission to the Chairmen of the House Appropriation and Senate Finance Committees by August 31, 2004. The amendment also specified that the plan shall include any necessary steps to ensure that the purposes of the Chesapeake Bay Preservation Act are implemented by DCR.

2003 Virginia Ground Water Festival

The 2003 Virginia Ground Water Festival was part of a combined effort to educate Powhatan sixth graders on water resource protection. The event, held at Camp Brady Saunders in Goochland County, included interactive education stations on ground water protection and surface water monitoring. The event was expanded in 2003 to accommodate 300+ sixth grade students from Pocahontas Middle School. The students were split into two groups - half of them attended the surface water monitoring event, the other half attended the ground water protection event. Upon returning to the classroom the students gave presentations on their experiences.

Our partners who supported us in this event: US EPA Region III, National Project W.E.T., Nestle Waters North America, Henricopolis Soil and Water Conservation District, US Geological Survey, Goochland Department of Health, VA Department of Conservation and Recreation, VA Department of Health, VA Department of Environmental Quality-Piedmont Regional Office, the VA Ground Water Protection Steering Committee, and Royall Pump and Well Company Inc.

Stations on ground water protection covered water supply development (our thanks to Royall Pump and Well Co. Inc. for having a drill rig on site!), watersheds, ground water - surface water interaction, geographic information systems, ground water's role in the hydrologic cycle, pollution prevention, and on-site sewage disposal.

Two additional festivals where scheduled at Camp Kittamaqund in Northampton County however damage to the Camp from Hurricane Isabel resulted in the cancellation of both of these festivals. For more information contact Mary Ann Massie at 804-698-4042 or email mamassie@deq.virginia.gov or visit www.deq.virginia.gov/education/gwf.html

Pocahontas Middle School students examine models of secondary treatment systems, recirculating sand filter (foreground) and an aerobic treatment unit.

Scott Bruce, DEQ, explores private well installation in the Piedmont physiographic province. George Harlow, USGS, supported this discussion with a video on fractured rock wells.

Tom Griffin, DEQ, challenges students to examine product labels to protect water resources.

Pocahontas Middle School students, DEQ Director Bob Burnley, and DEQ Deputy Director Rick Weeks listen as Scott Bruce explains how drill rigs operate.

Water Supply Planning

The 2003 session of the Virginia General Assembly passed legislation requiring DEQ to develop criteria for local and regional water supply planning regulations and a draft water resources plan for the Commonwealth by December 1, 2003. DEQ worked closely with a technical advisory committee composed of representatives from local government, regional planning entities, environmental interest groups, business and industry interest groups, and public water purveyors during 2003 to develop these two products.

The goal of this effort is to develop a consensus based draft regulation that would require local or regional water supply plans for the entire Commonwealth. Although the technical advisory committee did not reach full consensus on all language that will be included in regulation, there was strong consensus that water supply planning is a valuable and needed activity in Virginia and that localities will need technical and financial support to develop meaningful water supply programs. DEQ was successful in the 2004 session of the General Assembly in obtaining authorization to create seven water supply planning positions to provide technical support to localities and will continue to seek opportunities to provide financial support for local water supply planning activities.

The Water Policy Technical Advisory Committee will continue to meet during 2004 to provide valuable guidance on the development of local and regional water supply planning regulations for the Commonwealth. DEQ has committed to completion of draft local and regional water supply planning regulation by October 1, 2004. This draft regulation will then be presented to the State Water Commission and the State Water Control Board for their consideration. It is anticipated that general public input required by the Administrative Process Act, including a series of public hearings, will be initiated early in 2005. The activities of the Water Policy Technical Advisory Committee can be tracked at http://www.deq.virginia.gov/watersupply/waterpolicy.html. For additional information please contact Scott Kudlas at 804-698-4456 or swkudlas@deq.virginia.gov.

The Ground Water Protection Steering Committee is an inter-agency advisory committee formed to stimulate, strengthen and coordinate ground water protection activities in the Commonwealth. The Annual Reports allow us to highlight our progress; to educate Virginia citizens, businesses, and officials about the importance of ground water; and to publicize state programs that can assist those relying on ground water to ensure its continued quality and availability.

Particular emphasis is made at the meetings on education and information exchange. In 2003 our members heard presentations on DEQ's Water Resources Impact Workgroup, 2003 legislative activities, DHCD's Dry Well Replacement Program, Stewardship Virginia Field Day/Virginia Ground Water Festival and Water Monitoring Day, and DEQ's Brownfield/Land Renewal Program.

For more information on the Steering Committee visit www.deq.virginia.gov/gwpsc or call Mary Ann Massie at 804-698-4042.

Virginia Water Resources Research Center

The 2003 Virginia General Assembly requested, under Senate Joint Resolution 381, that the Virginia Water Resources Research Center conduct a study into the feasibility of using desalination as a strategy to help meet the future needs of the Commonwealth. This report was completed in late June and was sent to the State Water Commission and the Virginia Department of Health. The report focuses on the issues pertinent to the implementation of desalination to supplement drinking water sources in eastern Virginia and takes into consideration the current technology, environmental concerns and regulations, energy availability and cost, water source availability, and the end cost to the consumer. The report is available on the Water Center's website, http://www.vwrrc.vt.edu/publications/recent.htm

As part of the Water Center's mission of education and outreach, the Service Training for Environmental Progress (STEP) is administered by the Center in partnership with the Virginia Tech Service-Learning Center and provides students with hands-on experience. Through STEP, students live in Virginia communities for eight weeks and work on water-related projects identified by the community. Four students participated in the summer 2003 program: Nathan Mitchell, a May 2003 Virginia Tech graduate in environmental policy and planning, helped the Agriculture and Nature Center, McGaheysville (Rockingham County), a non-profit organization, identify potential conservation practices for its stream, pond, and landscape that the group can implement and use for environmental education; Chris Perez, a May 2003 Virginia Tech graduate in environmental policy and planning, assisted in the implementation of a wetland complex being constructed to improve water quality in an acid-mine-drainage-impacted stream on the campus of the University of Virginia's College at Wise for the Lonesome Pine Soil and Water Conservation District, Clintwood (project located in the town of Wise).

In 2003, the Water Center awarded over $60,000 in grant funds to support water research on relevant water issues facing the Commonwealth. The researchers and their topics for the competitive grants are: Gregory S. Hancock, The College of William and Mary, "Hydrologic Impacts of Urbanization on Small Watersheds and the Effectiveness of BMPs Williamsburg/James City County, Virginia"; Kurt Stevenson, Virginia Tech, "Water Demand Reduction Effectiveness of Drought Curtailment Policies in Virginia"; Peter Vikesland, Virginia Tech, "Effects of Dissimilatory Iron Reducing Bacteria on the Longevity of Iron Permeable Reactive Barriers"; and James N. Galloway, University of Virginia, "Identification of Native Brook Trout Streams that are Impaired by Acidification". Seed grants were awarded to: James A. Smith, University of Virginia, "Monitored Natural Remediation of Contaminated Ground Water by Diffusion and Barometric Pumping" and Vinod Lohani, Virginia Tech, "Initiation of Activities to Establish an Institute for Drought Management Studies".

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The Virginia Water Resources Research Center will host its annual VIRGINIA WATER RESEARCH SYMPOSIUM 2004 in Blacksburg, Virginia on October 4-6 at the Donaldson Brown Hotel and Conference Center on the Virginia Tech campus. The symposium brings together those individuals interested in water supply and water quality issues and provides an opportunity for the presentation of the most recent research and technical reports and facilitates the discussion of mutual issues and problems across a wide range of disciplines. On a daily basis, water users, planners, researchers, and policy makers are faced with the problems of the lack of adequate water supplies due to droughts and regional water management conflicts, pollutants, aging infrastructure and water distribution systems, groundwater supply and availability, alternative water sources, unsafe and inadequate water in rural and isolated communities, and source water protection.

The Water Center would like to encourage any one involved in water supply, management, or affected by regulatory policy, consulting engineers, government regulators, municipal utility managers and private operators, researchers, students, and others concerned with drinking water to attend this symposium. For more information, contact Jane Walker, janewalk@vt.edu or Judy Poff, jupoff@vt.edu, (540) 231-4159 or (540) 231-8030, or fax (540) 231-6673.

Source Water Protection Contract

The Virginia Department of Health, Office of Drinking Water contracted on July 1, 2003 with Olver, Inc. out of Blacksburg, VA to assist in the development and implementation of a Source Water Protection Program for small community groundwater waterworks (pop. <3,300) not located in the Coastal Plain Physiographic Province of Virginia. These small community waterworks were separated into three categories: Priority 1, Priority 2, and Priority 3 based on risk susceptibility of source, population served, and ease and ability to develop a protection program.

The contractor solicited and began working with numerous waterworks. Documents were prepared and signed that act as a commitment to develop and implement a protection program. The contractor assists in facilitation of meetings and preparation of literature and brochures. The process works by forming committees made up interested citizens, waterworks staff, and elected officials. Once the committee is educated on the program, they are asked to start the process of forming a program. The contractor assists in establishing the program and then will leave the committee to maintain and implement measures on their own once they are ready.

To date, draft wellhead protection programs have been formed in the Town of Edinburg, Town of Rural Retreat, Town of Hamilton, Town of Round Hill, Town of Lovettsville, Beacon Hill-LCSA, Lenah Farms-LCSA, Plains of Raspberry-LCSA. Estimated population served by these communities totals to 10,460.

Further technical assistance can be provided either by the contractor or by Office of Drinking Water staff to aid waterworks once a program has been established to ensure implementation is carried forward. For more information on source water protection contact Chris Adkins with the Virginia Department of Health 804-864-7495 or email chris.adkins@vdh.virginia.gov

Additional information is available on their web page at www.vdh.virginia.gov/dw

Funding for the Virginia Ground Water Protection Steering Committee activities, including development of this Report, is provided through a grant to the Department of Environmental Quality by the U.S. Environmental Protection Agency.

The Commonwealth has many agencies in transition with new URL addresses and email addresses. The URL for the Department of Environmental Quality and the Ground Water Protection Steering Committee is now www.deq.virginia.gov and www.deq.virginia.gov/gwpsc

Current agency URLs are available at http://www.vipnet.org/cmsportal/government_881/state_1089/index.html

The Ground Water Protection Steering Committee meeting is held on the third Tuesday of the odd numbered months (January, March, May, July, September, and November)

Meetings are generally held at the Department of Environmental Quality, 629 East Main Street, Richmond from 9 a.m. to 11 a.m. Meetings are open to the public.

For more information contact Mary Ann Massie at DEQ 804-698-4042 or email mamassie@deq.virginia.gov or visit www.deq.virginia.gov/gwpsc

Meeting summaries and announcements are posted on the Regulatory Townhall at www.townhall.virginia.gov

Cap It, the James City Service Authority's (JCSA) private well abandonment program, continues to assist private well owners in James City County. In its third operational year, Cap It has become a successful, publicly known ground water protection program in James City County, Virginia. Cap It is a source water protection program that educates James City County residents on the dangers of open, old, and improperly abandoned wells and provides free well abandonment to private well owners. The goal of Cap It is to help protect local groundwater resources and the Chesapeake Bay by educating residents about the dangers of old, open, and improperly abandoned wells.

James City County is the largest municipality in Virginia reliant almost solely on groundwater for its public drinking supply. The JCSA maintains twenty-nine well facilities and nine independent well systems within the Primary Service Area (PSA). County residents who reside outside of the PSA rely on private wells.

The JCSA draws water from the Chickahominy Piney Point Aquifer and the Middle and Lower Potomac Aquifers. Private wells draw water either from the shallow table water aquifer or from the Chickahominy Piney Point Aquifer.

The JCSA estimates that the County is home to over four hundred old, unused, or improperly abandoned private wells. These wells pose an immediate threat to our groundwater resources, out streams and rivers, and the Chesapeake Bay. Many private wells owners are not aware that the Virginia law requires wells not in use to be abandoned. Many cannot afford to close the wells and some simply do not care.

CAP IT
JAMES CITY SERVICE AUTHORITY

With $20,000 from the JCSA and $15,000 from a 106 Groundwater Protection Grant from the Virginia Department of Environmental Quality, Cap It has abandoned 29 wells thus far in 2004. Since its launch in 2002, Cap It has abandoned a total of 125 residential wells.

A customer survey was developed recently in order to follow-up, obtain feedback and collect valuable data from program participants. Approximately 125 surveys have been mailed to applicants from each year of the program and 30 completed surveys have been received thus far. Applicant satisfaction has been expressed in the following comments: "Would like to thank all involved for their promptness and we were so pleased with the process."; "Thank you. I would

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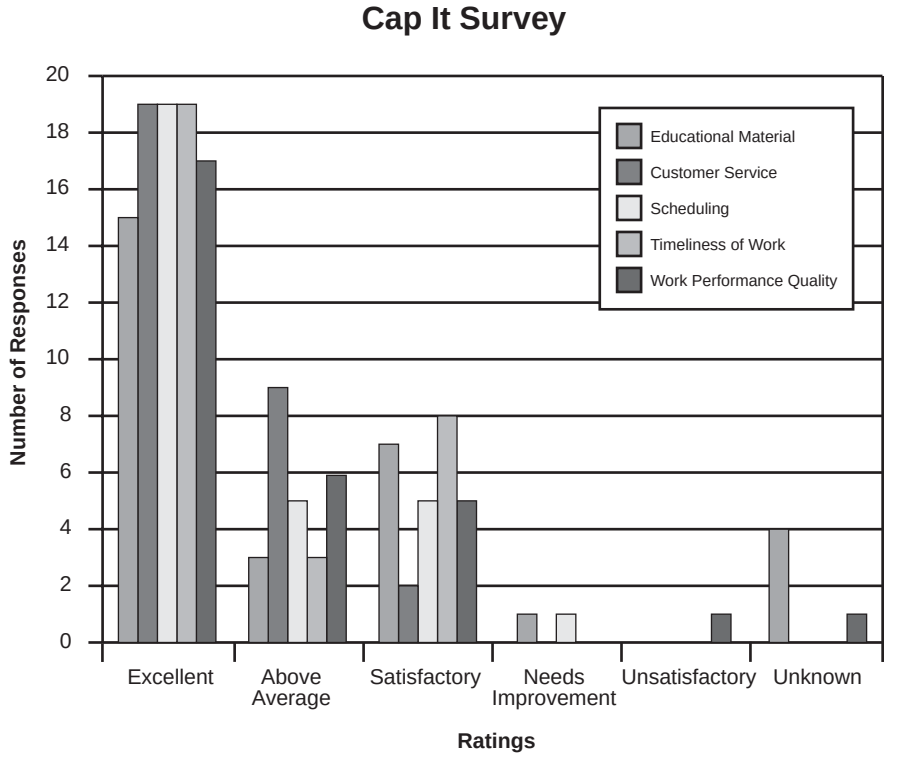
Cap It Totals	Year One 2002	Year Two 2003	Year Three 2004	TOTAL
2" Wells Abandoned	8	7	12	27
4" Wells Abandoned	5	4	1	10
30" Wells Abandoned	40	32	16	88
Total No. Wells Abandoned	53	43	29	125



Virginia Demonstrates Leadership Implementing RCRA Corrective Action Program

Virginia Department of Environmental Quality (DEQ) was recognized for outstanding leadership in implementing the corrective action program and Resource Conversation and Recovery Act (RCRA) reforms. DEQ was authorized for corrective action in 2000, and since that time, has worked closely with Region 3 to achieve Government Performance Results Act (GPRA) goals and support the RCRA Corrective Action Reforms in several key areas.

Facility Lead Program: A "Facility-Lead Agreement" (FLA) encourages RCRA facilities to take a leadership role in addressing corrective action obligations using a streamlined administrative process resulting in efficient investigations and cleanups. DEQ has been a strong advocate of the FLA program and has been instrumental in making it a success in Region 3. The first FLA in Region 3 was with the University of Virginia. Currently, of the 26 sites participating in FLAs in Region 3, 50 % of the facilities are located in VA. FLA sites in Virginia include a variety of industrial, academic and federal facilities. DEQ and Region 3 staffs have worked together closely to make this Corrective Action Reform a huge success. FLAs have played a significant role in helping EPA and DEQ achieve GPRA goals in the Commonwealth.

Environmental Indicators: DEQ managers and staff have structured their program with the goal of meeting GPRA corrective action deadlines. Prior to authorization, DEQ provided significant technical assistance to the Region through work sharing activities in the RCRA grant. After authorization, DEQ has primarily focused its efforts on state lead facilities but has also continued to collaborate with the Region on federal lead sites as well. As a result of DEQ's results oriented program, VA sites have exceeded meeting the national GPRA goals. By the end of FY03, 74% of VA sites had met the Human Health indicator, vs. the national goal of 65%. For the same time period, 58% of VA facilities had met the Ground water Indicator, vs. the national goal of 50%.

Promoting Redevelopment: DEQ has also worked closely with Region 3 in promoting facility redevelopment. Two prominent revitalization examples include the Genicom and Handcraft facilities. For Genicom, DEQ developed its first RCRA Comfort Letter in conjunction with the Region's first RCRA Prospective Purchaser Agreement facilitating reuse of a bankrupt and abandoned facility. The new owner is using the site for warehouse operations. The facility is likely to be subdivided for additional uses in the future. DEQ and EPA used a Facility Lead Agreement and a jointly signed Comfort Letter to facilitate redevelopment of an abandoned dry cleaner. As a result of DEQ's innovative approach, the abandoned Handcraft Dry Cleaners now serves as the location for the 1000th Pier 1 Imports store.

Facilities Undergoing Corrective Action in the Commonwealth: There are at least 34 hazardous and solid waste facilities undergoing corrective action for ground water in the Commonwealth. The facilities are using a number of ground water remediation technologies, including ground water extraction, air stripping, insitu chemical oxidation, microbiologic enhancement, chemical fixation, and engineered wetlands. Carbon filtration and alternate water supplies have been provided by facilities where an immediate threat to human health has been determined to be present. Where ground water corrective action has been implemented, the clean-up goal is maximum beneficial use, which is unrestricted residential use of the ground water. To date, seven facilities have completed corrective action and addressed ground water releases at their sites.

For more information on corrective action contact DEQ staff member Maria Williams at DEQ 804-698-4211.

For information on regulated unit and solid waste contact DEQ staff member Howard Freeland 804-698-4219.

Agricultural Stewardship Act Program Report

APRIL 1, 2003 THROUGH MARCH 31, 2004

Background and Overview

The Agricultural Stewardship Act is the result of a joint effort by Virginia's agricultural and environmental communities, the Association of Soil and Water Conservation Districts, and state agencies to develop a common-sense solution to water pollution problems caused by agricultural operations. The Commissioner of the Virginia Department of Agriculture and Consumer Services is responsible for the administration and enforcement of the ASA. The goal of the Act is to consider the needs of the farmer while meeting the requirements of the environment.

The Virginia General Assembly passed the law in 1996, and when the Agricultural Stewardship program went into effect on April 1, 1997, it represented a very innovative approach to environmental issues.

How the Program Works

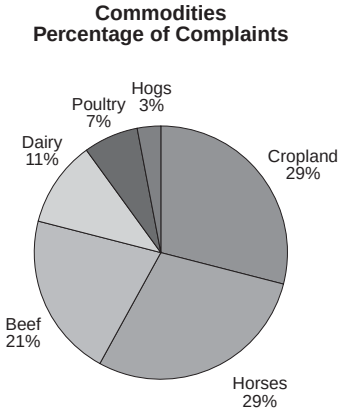
Complaints alleging that a specific agricultural activity is causing or will cause water pollution go to the Commissioner of the Virginia Department of Agriculture and Consumer Services. If a complaint meets the criteria for investigation, the Commissioner's Office contacts the appropriate Soil and Water Conservation District about investigating the problem. If the district declines, the Commissioner's Office conducts the investigation.

The purpose of the investigation is to determine whether the agricultural activity is causing or will cause water pollution. If no causal link is found, the Commissioner will dismiss the complaint. If the investigation determines that the activity is the cause, the farmer is given sixty days to develop a corrective plan. The local District then reviews the plan and when it meets the necessary requirements to solve the water pollution problem, the Commissioner approves it.

From the time the Commissioner determines that a complaint is founded, the Act gives the farmer six months to start implementing his plan and up to eighteen months for full implementation. The timing allows the farmer to take advantage of suitable weather conditions for outside work or construction required. If a farmer fails to implement a plan within the 18 month time limit, the Act requires the Commissioner to take enforcement action.

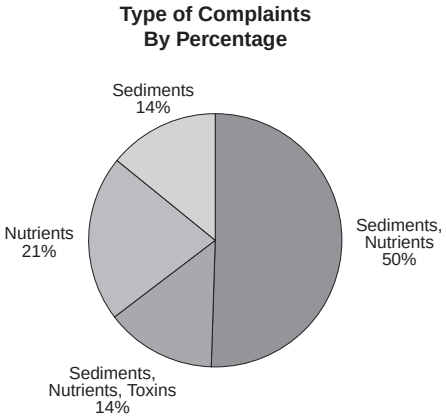
Summary of Complaints

In the seventh year of the Agricultural Stewardship program, the Commissioner received more than 150 inquiries regarding possible agricultural pollution, of which 28 became official complaints. These official complaints fell into 6 different categories according to commodity produced or raised: beef - 6 (21%); cropland - 8 (29%); dairy - 3 (11%); horse - 8 (29%); poultry - 2 (7%); and hog - 1 (3%).



April 1, 2003 – March 31, 2004

The Agricultural Stewardship Act addresses water pollution problems caused by nutrients, sediments and toxins entering state waters from agricultural activities. Fourteen complaints received in the reporting period indicated that both sediments and nutrients were involved. Six complaints were attributed to pollution problems involving nutrients only, while 4 faulted only sediments and four alleged to be sediment, nutrient, and toxin were contributed to pollution problems.



April 1, 2003 – May 31, 2004

The Commissioner's Office, together with local SWCD's in many cases, completed investigations for 23 of the 28 official complaints received. As of March 31, 2004, 5 complaints were awaiting a decision by the Commissioner.

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Virginia Dry Well Replacement Program

In November 2002, Governor Mark Warner announced the creation of the Virginia Dry Well Replacement Program (DWRP) to provide funds to drill new wells for low-income citizens whose wells had gone dry due to the extended drought. The aim of the DWRP was to provide a reliable (deep well) source of water not directly related to fluctuations in surface water. Between July 1, 2002 and October 15, 2002, more than 6,200 homes had depleted well water. Many of these were shallow wells that were directly affected by drought conditions.

The DWRP is a temporary set-aside program under the Community Development Block Grant (CDBG) program designed to provide financial assistance to qualifying low-income households. In order to facilitate the program, the Department of Housing and Community Development was required to amend its 2002 Program Design, which describes funding uses and policies of the Virginia CDBG program. The U.S. Department of Housing and Urban Development (HUD) also had to approve the reallocation of funds for the DWRP.

The DWRP is administered through local governments and nonprofits in CDBG non-entitlement localities, which are localities, usually smaller cities and rural counties, that do not receive CDBG funding directly from HUD. The entities (local government, non-profit organizations, etc.) that administer the DWRP are the same entities that administer the CDBG program for non-entitlement localities. Typically, the grantees are already working in their communities and have better knowledge of households in need as well as a familiarity with local contractors. Local authorities appreciated the minimal regulatory and paperwork requirements under the DWRP.

Funds were made available to individuals as a zero percent interest loan, amortized over ten years. Payback of the loan is predicated on the client's ability-to-pay. Loans must be secured with a lien held by the locality or sub recipient. The difference between the client's ability-to-pay and the actual cost of the loan per month at 0% interest is forgiven on a monthly basis.

Once the program was fully operational, the state experienced a significant increase in rainfall. While the program continued after the increase in rainfall, it is estimated that spending for projects was reduced by as much as 25% because of the rain. Of the $2 million that had been set-aside for the program, approximately$1,151,554 has been distributed and 233 wells have been replaced. Fifty-one counties contracted with DHCD for the DWRP (See shaded areas on map).

The DWRP is no longer accepting applications. DHCD estimates that 90% of the projects under the DWRP are closed. Once the remaining approved projects are completed, DHCD would have to amend its CDBG program design and seek approval from HUD in order to restart program operations. DHCD would in all probability implement the program again if a similar drought occurred and resulted in many dry wells. According to DWRP guidelines, unused funds will be used for projects under the CDBG-funded Self-Help Program and Competitive Grant Projects.

For more information on Department of Housing and Community Development programs call 804-371-7000 or visit them on the web at www.dhcd.virginia.gov

DMME Database on Underground Mine Workings

For over a decade, the Virginia Department of Mines, Minerals and Energy (DMME) has been building a geographical electronic database describing the location and extent of underground coal mine workings. Underground mine works often become reservoirs for large quantities of ground water, and the flooded works can be a valuable environmental resource. However, unknown locations and extents of mine workings can pose a safety hazard to both the public and mine workers. With a 2003 grant from the federal Mine Safety and Health Administration (MSHA), DMME continues to expand the database covering old, abandoned underground coal mine workings.

Maps of old, abandoned underground mine works are a valuable information resource and with today's computer technology can be overlaid on standard topographic maps and more detailed aerial photographs to help pinpoint the location of active mining compared to abandoned mine works. While there may be no way to confirm the accuracy of the old mine maps, having them to work from is better than having no information at all. The database has helped the agency and coal industry identify and prevent accidental mining into abandoned mine workings which can endanger miners. Placement of old maps can also provide valuable information in evaluating if mine pools should be dewatered for public safety concerns.

Over the years, DMME has received considerable information from coal and land companies that opened their files, enabling DMME to add old mine maps created before the agency existed or requirements mandated that copies be submitted to DMME. Another valuable resource are early underground mine maps as keepsakes or memorabilia in the possession of retired miners, their descendents or others. DMME borrows these maps so they can be scanned into the database and then returned to the loaner.

Anyone having old underground coal mine maps they would like to loan to the DMME, may contact the office in Big Stone Gap, VA at (276) 523-8231 or in Keen Mountain, VA at (276) 498-4533, or via e-mail at DmmeInfo@dmme.virginia.gov.

The Division of Consolidated Laboratory Services (DCLS)

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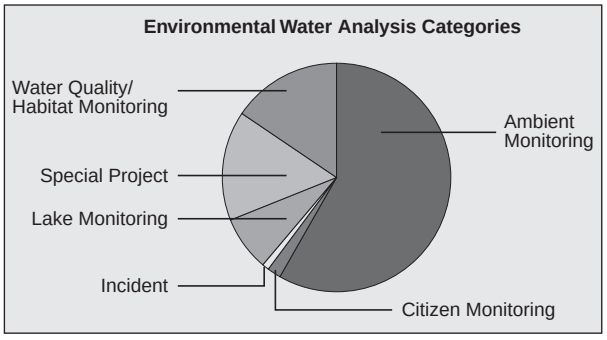
different sample types tested is provided below.

DCLS also embarked on its first full year of testing drinking water samples on a fee-for-service basis. During this period over 80,000 drinking water kits were assembled and distributed, four new courier sites were added to improve sample transport, collection procedures for 46 water testing methods were revised and placed on the DCLS web page for easy customer access and sample rejections due to improper submissions in 2003 were reduced by over 32% while the number of sample submissions increased by nearly 4%.



For more information on programs and activities at the Division of Consolidated Laboratory Services, please contact the main switchboard at 804-648-4480, visit their web page http://dcls.dgs.state.va.us, or contact GWPSC representatives Jim L. Pearson, Dr. P.H., DGS Deputy Director for Laboratories, (804) 648-4480 ext 150 jpearson@dgs.state.va.us or Tom L. York, Ph.D., Director, Analytical Services (804) 648-4480 ext 151 tyork@dgs.state.va.us

The U.S. Geological Survey (USGS)

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Department of Environmental Quality (DEQ). Thus far, ground-water quality samples have been collected from representative wells to define the chloride distribution in the aquifer system. A sub sample of these wells was also analyzed for ground-water age dates to estimate ground-water recharge rates. These data are being used to aid construction of the revised model, which features 37,740 model cells spaced at thousand-foot intervals. Such high spatial resolution enables accurate representation of important hydrogeologic features such as deeply buried paleochannels formed by the ancestral Susquehanna River, which potentially act as leaky conduits between the shallow and deep flow systems. The Eastern Shore of Virginia is a sole-source aquifer that has been designated by the Commonwealth of Virginia as a ground-water management area. The updated model will be used by local communities for long-term water supply planning and by the Virginia DEQ to support ground-water permitting decisions.

Lastly, region-wide characterization of ground water throughout the Virginia Coastal Plain continues this year. This large scale effort is being carried out in cooperation with DEQ and the Hampton Roads Planning District Commission (HRPDC). The Chesapeake Bay impact crater was discovered during the 1990's in collaboration between USGS and DEQ. With recognition of the crater's implications for the ground-water resource, the Coastal Plain aquifer framework and ground-water flow model are being revised (see 2000, 2001, and 2002 Annual Reports). During 2004, stratigraphic correlation of bore-hole geophysical logs was expanded to include a total of 431 logs, which are being used to refine a geographic information system that represents the configuration of aquifers and confining units. In addition, a challenging effort was undertaken to drill 2,700 feet to reach basement bedrock near the center of the crater at Cape Charles. Core retrieved from the bore hole revealed exciting features of the impact (figure 2), and two deep observation wells were constructed. Hydro-chemical analyses of pore water from the core and water from the wells will further understanding of the origin of salty ground water associated with the crater, including the geologic evolution of highly saline brine that likely developed from hydrothermal activity following the impact.

Figure 2. *A cobble-sized piece of melt rock is surrounded by chaotically mixed sediment in a section of core more than 2,500 feet deep, which was drilled from the Chesapeake Bay impact crater at Cape Charles during May 2004. The approximately 2-inch diameter core is shown here residing in a cardboard storage tray. The swirled texture of the melt rock indicates the flow-induced structure of the piece, which under the intense heat and force of the impact was hurled as a molten blob through the atmosphere -- possibly for miles -- before landing and being buried within sediments filling the crater.*

Development of a new regional ground-water flow model of the entire Virginia Coastal Plain also continued during 2004 (see 2003 Annual Report). The new model possesses improved features such as the ability to simulate variable-density flow near coastal areas, more accurate ground-water level computation, and a fine vertical resolution of the aquifer framework. Geologic time-frame simulations have improved understanding of the origin of saltwater in the impact crater. Currently, ground-water ages and salinities are being used to calibrate the model based on simulations of historic ground-water levels and withdrawals. Southeastern Virginia and the York-James Peninsula have been designated by the Commonwealth of Virginia as a ground-water management area. The calibrated model will be used by DEQ and HRPDC for long-term water supply planning and to support ground-water permitting decisions.

For more information on the northern Shenandoah Valley project contact George Harlow at 804-261-2631. For more information on the Coastal Plain projects contact Randy McFarland at 804-261-2641.

Virginia Karst Program - DCR Division of Natural Heritage

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Underground, soared in 2003. Teachers from across the state learned how to integrate education about karst into the classroom through fourteen teacher workshops. The karst education coordinator continued a strong presence beyond the borders of the Commonwealth by representing Virginia DCR at both the National Cave and Karst Research Institute planning meeting and the Chesapeake Bay Environmental Education Summit. Staff brought a karst component to DEQ's Children's Groundwater Festival in Goochland County, introduced karst concepts to over one thousand students and thousands of adults at the Virginia Tech Farm and Family Showcase, and both delivered the Project Underground curriculum to participants and led two field trips at the EPA Region III-IV Sourcewater Protection in Karst Workshop. Finally, staff led a workshop on stormwater management in karst attended by approximately 80 consultants, agency staff, planners, and citizens. The results of this workshop should assist in the revision of stormwater regulations to better address karst issues.

Karst Program staff continued to provide technical assistance through DCR's Environmental Project Review office and in response to direct inquiries from consultants, other agencies, localities, and citizens. Too numerous to mention individually, consultation on projects led in most cases to improvement of water quality through minor modification of project design parameters. The data development tools mentioned above are proving critical in making the technical assistance component of the karst program work efficiently. Within the Natural Heritage Division, karst program staff worked to prioritize karst lands for acquisition and to develop management strategies for state-owned karst resources. Staff is also working with the Virginia Outdoors Foundation to incorporate karst protection measures into conservation easements throughout western Virginia.

For more information on DCR's karst program contact Wil Orndorf at 540-831-4056.

For more information on Project Underground contact Carol Zokaites at 540-831-4057.

Virginia Water Resources Research Center

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In the November 2003 issue of the *Virginia Water Central*, the article, "Groundwater Levels at Selected Virginia Wells, Summer 2003" was published. Topics on Virginia's precipitation, stream flow, and groundwater levels are published on a rotating basis with one topic covered per issue. Each issue is published on the Water Center's website, www.vwrrc.vt.edu as soon as it is available. Past issues can also be found on the Center's website.

For more information on activities at the VWRRC contact Judy Poff at 540-231-8030.

Cap It

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not have been able to afford having this work done. The lady that helped me was very nice and answered all my questions. Thank you again."; "Outstanding program!".

The JCSA will continue the Cap It program indefinitely, with the goal of abandoning every old, unused, or improperly abandoned well in James City County. For more information, contact Beth Davis at (757) 253-6859, bdavis@james-city.va.us, or visit www.bewatersmart.org/capit

How did you hear about Cap It?	
Newspaper	37%
Health Department	13%
Well Contractor	20%
Other	30%

Why did you apply to Cap It?	
Protect Groundwater	44%
Safety	38%
Finances	9%
Other	9%

2003 Plastic Pesticide Container Recycling Program

The Virginia Department of Agriculture and Consumer Services (VDACS), in cooperation with the Virginia Pesticide Control Board (PCB) and local governments, continued the Plastic Pesticide Container Recycling Program (PPCRP) in 2003. The program is a local option-type program available to all Virginia localities and offers the agricultural community, as well as pest control firms, an environmentally responsible alternative for the disposal of properly rinsed plastic pesticide containers. In its eleventh year of operation, the PPCRP recycled approximately 54,000 plastic pesticide containers in eighteen localities and eleven pesticide dealer locations around Virginia.

Figure 1. *Granulating pesticide containers*

To participate in the PPCRP, a locality must make application to VDACS and agree to collect, inspect and store the properly rinsed pesticide containers until granulation. VDACS provides $1,875 in cost-reimbursement grants to participating localities to help offset the localities' costs for conducting the program.

Since the program's inception in 1993, over 612,000 plastic pesticide containers have been recycled and not burned or placed in landfills. This equates to over 459,000 pounds or greater than 229 tons of plastic.

For more information on this program contact Dan Schweitzer at 804-786-4865 or visit http://www.vdacs.state.va.us/pesticides/index.html

Pesticide Disposal Program

During 2003, the Virginia Department of Agriculture and Consumer Services evaluated the Pesticide Disposal Program for effectiveness and determined that there is still a need for the program. The Virginia Pesticide Control Board approved continuation of the program. Collections will begin again in July 2004 and continue through early December 2004 in the Richmond/Tidewater area.

For the purposes of this program, Virginia has been subdivided into five regions. The disposal program is being conducted in one region per year until it has been conducted in each region of the state. Once completed and funding permitting, the cycle will begin again. For more information, please contact Daniel Schweitzer at (804) 786-4865.

Virginia Rural Water Association

The year 2003 was a very profitable one for the VRWA Source Water Program. We dived into new territory by performing dye testing in karst areas, allowing us to better understand the watershed, which gives a new perspective on how to approach protecting these fragile areas. Three Source Water plans were completed last year by VRWA Source Water Specialist; the systems include the Town of Broadway, the Town of Round Hill, and the Peacock Hill Service Authority. All three systems completed the six steps of VRWA Source Water Plan. Work continues on field checking VDH's Source Water Assessments, and assisting rural water and wastewater systems throughout Virginia. For more information on VRWA's Source Water Program contact Eric Shortt at 540-261-7178.

Agricultural Stewardship Act Program Report

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Of the 23 complaints on which the Commissioner acted before the end of the twelve-month period, Department investigations determined that 11 of the complaints revealed insufficient or no evidence of water pollution, therefore, these complaints were unfounded. In 4 cases, the complaints were dismissed because the complaints related to matters outside of the purview of the ASA. In 12 of the investigations, there was sufficient evidence to support the allegations that the agricultural activities were causing or would cause water pollution. These cases were determined to be founded.

Results of Complaints

April 1, 2003 – May 31, 2004

Plan Development, Review and Maintenance

The Department's efforts to investigate complaints are just the beginning when a complaint is determined to be founded. The agency is also charged with working with farmers and local soil and water conservation districts on the development of plans to address identified pollution problems. The Department is responsible for conducting six-month and 18-month field reviews to make sure that plans are on schedule as far as implementation and that implemented plans are maintained to prevent the re-occurrence of pollution problems identified by the Department in its response to complaints received under the ASA.

Educational Activities

During the program year, VDACS participated in meetings held by state soil and water conservation districts (SWCD's) at the regional and state levels and participating in meetings held by various commodity and agricultural groups.

Conclusion

The ASA program continues to be successful in providing a positive approach to responding concerns about farm operations. Cooperation from SWCD's and the agricultural community has been the key to this overall success. For more information on VDACS ASA contact Glenn Martin at 804-786-2658.